LIPO COMPETITION CAR LINE

3C CHARGE CURRENT UP TO 110C/55C DISCHARGE CURRENT

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HIGH-PERFORMANCE HARDCASE POWERPACKS

DEAR CUSTOMER,

thank you for your trust in this LRP product. By purchasing a LRP VTEC Competition Car Line Hardcase LiPo battery, you have chosen a high-performance battery for your RC model. Please read the following instructions to ensure, that your LRP VTEC Competition Car Line Hardcase LiPo battery always works up to your full satisfaction.

LiPo-batteries need special treatment and care. Please read the following instructions carefully before you start using your LRP VTEC Competition Car Line Hardcase LiPo battery. This user guide contains important notes for the installation, the safety, the use and the maintenance of this product. Thus protecting yourself and avoid damages of the product.

Proceed according to the user guide in order to understand your LRP VTEC Competition Car Line Hardcase LiPo battery better. Please take your time as you will have much more joy with your product if you know it exactly.

This user manual shall be kept in a safe place. If another customer is using this product, this manual has to be handed out together with it.

1. CONNECTIONS

All LRP VTEC Competition Car Line Hardcase LiPo packs have 4mm gold plug sockets built into the battery pack. These power connections have to be used for standard charging and for all applications in the model/device. Be sure to always take care of the right polarity, which is shown on the hardcase of the battery, as a wrong connection will damage your battery and your speedo. While soldering, take care that you don´t do any short circuits and that all wires are well insulated.

Additionally to the 4mm gold plug sockets, all LRP VTEC Competition Car Line Hardcase LiPo packs, except the 1S packs, use a 2mm gold plug socket, which acts as a cell connection between the two cells in the pack. The 3S packs are equipped with a so-called EHR-Balancing-port. This connection can be used for balancing the cells aswell. This connection is used for balancing the LRP VTEC Competition Car Line Hardcase LiPo pack.

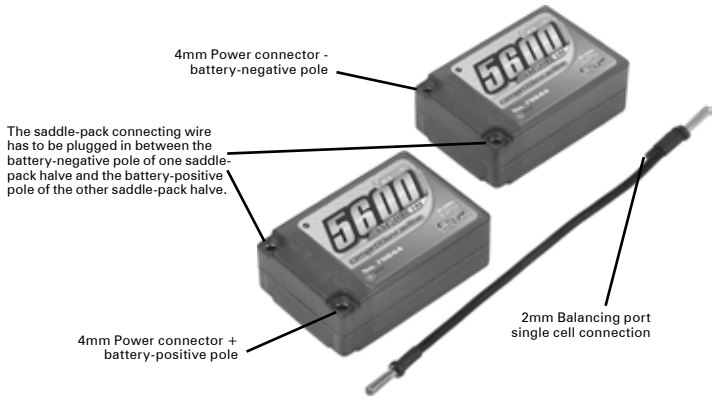
Special balancers or certain chargers use this balancing port to perfectly condition and equalize the individual cells inside the pack. Please check the user manual of the balancer/charger in order to know how the battery needs to be hooked up. For perfect charging and conditioning of the batteries, we recommend our LRP PULSAR TOUCH COMPETITION (No. 41555).

Note: The Balancing-port shall not be used for the standard use in the model/device. Only use the 4mm gold plug sockets to power your model/device.

For perfect conditioning of your LRP VTEC Competition Car Line Hardcase LiPo pack, we recommend the use of our LRP LiPo Parallel Precision Balancer (No. 45200), if you use a charger without built-in balancer, together with the LRP LiPo Hardcase balancing wire (No. 65832). The balancing wire allows to plug in the balancer directly without the need of additional soldering work. For best possible performance and safety, always use this balancer when charging your LiPo battery.

Balancing-port (2S - 7.4V packs)
4mm gold plug socket (battery -) = Cell 1-
2mm gold plug socket (call conn.) = Cell 1+ (Cell 2-)
4mm gold plug socket (battery +) = Cell 2+

Balancing-port 4-pole (3S - 11.1V packs)	
Black (Battery-Negative)	= Cell 1-
Brown (cell connection 1)	= Cell 1+ (Cell 2-)
Orange (cell connection 2)	= Cell 2+ (Cell 3-)
Red (Battery-Positive)	= Cell 3+


4mm Power connector - battery-negative pole
The saddle-pack connecting wire has to be plugged in between the battery-negative pole of one saddle-pack halve and the battery-positive pole of the other saddle-pack halve.
4mm Power connector + battery-positive pole
2mm Balancing port single cell connection
5600

2. CHARGING

Due to new and special manufacturing technologies, all LRP VTEC Competition Car Line Hardcase LiPo batteries can be charged with a maximum current of 3C*. For charging, only use chargers, which are specially designed and developed for LiPo-batteries. These chargers charge the battery with the max. current till the battery reaches the max. charging voltage. The charger then reduces the charging current until the battery is fully charged. This charging method is called CC/CV (Constant Current/Constant Voltage).

For charging the LRP VTEC Competition Car Line Hardcase LiPo batteries, we recommend our LRP PULSAR TOUCH COMPETITION (No. 41555).

ATTENTION: Under no circumstances use NiMH/NiCd-chargers or chargers, that are set to NiMH/NiCd mode, for charging LiPo-batteries! These chargers do not reduce the charging current and therefore ultimately lead to overcharging the battery!

LRP VTEC Competition Car Line Hardcase LiPo batteries batteries do not heat up during charging. It is normal, that the battery still has ambient temperature when it is fully charged. If the battery heats up during charging or warps, immediately stop charging it. A Balancer which monitors the voltage of each single cell is mandatory during the charge of LiPo batteries.

ATTENTION: Never charge your LiPo battery without a balancer directly connected to the balancing port of your battery, unless your charger is already equipped with a balancer.

The maximum charging voltage for each single LiPo-cell is 4.20V. If the battery reaches this voltage, the charge current has to be lowered. This is automatically done by the charger. If the charge current reaches 0.05 - 0.1C*, the battery is fully charged. Some LRP VTEC Competition Car Line Hardcase LiPo batteries batteries consist of multiple LiPo-cells. You can see the max. charging voltage in the table below. We advise the following settings for charging our LRP VTEC Competition Car Line Hardcase LiPo batteries batteries:

Cell configuration	max. charge current	recommended charge current	max. charging voltage
LRP VTEC Competition Car Line - 1S - 3.7V	3C*	12A	4.20V
LRP VTEC Competition Car Line - 2S - 7.4V	3C*	12A	8.40V
LRP VTEC Competition Car Line - 3S - 11.1V	3C*	12A	12.60V

Please note: You can use your LRP VTEC Competition Car Line Hardcase LiPo battery several times a day. However be sure, that the battery has completely cooled down to ambient temperature, before re-charging it again.

LRP VTEC Competition Car Line Hardcase LiPo batteries batteries do not have a memory effect and only a very low self-discharge rate. Therefore you can also charge batteries with a partial charge in them, without the need of discharging the pack before. Partially charged packs can be stored over a long period of time, without getting damaged. Please also see the „Storage" section for further reference.

** C=Nominal capacity of the battery. E.g. with a nominal capacity of 7000 mAh (7.0Ah), the battery can be charged with a max. current of 21.0A.*

3. DISCHARGING

All LRP VTEC Competition Car Line Hardcase LiPo batteries are capable of a maximum peak discharge current of 110C (55C/110C types), 100C (50C/100C types) or 80C (40C/80C types). The special manufacturing technology of the LRP VTEC Competition Car Line Hardcase LiPo batteries make these high discharge currents possible.

Please note: Always take care that the battery gets enough cooling when discharging it with high discharge currents.

You have to take care, that the batteries do not get deep discharged. As soon as the battery voltage falls below 3.00V per single cell, the battery pack gets damaged irrevocably. With 2S packs, the discharge cut-off voltage under load is 6.0V. With 1S packs, the discharge cut-off voltage under load is 3.0V. With 3S packs, the discharge cut-off voltage under load is 9.0V. The battery voltage should never fall below these discharge cut-off voltages. If your speed control does not have a special undervoltage protection for LiPo-batteries, you have to stop your model early enough in order not to deep discharge the battery pack. Therefore stop immediately as soon as you feel a rapid loss in power.

IMPORTANT: The max. temperature of the LiPo-battery during discharge must never exceed 65°C (150°F).

Note: If the batteries do swell or get thick after discharging them, it is a sign of overload and/or deep-discharge. The battery pack gets damaged due to this and the max. performance will get less. Swollen battery packs are not a product fault and therefore excluded from the limited warranty.

4. SPECIAL NOTES FOR HANDLING

- Avoid short-circuits! Short-circuiting the battery results in very high currents, which damage the internal structure of a LiPo-battery. This leads to a loss of power and capacity.
- Never charge LiPo batteries without a balancer. Charging without a balancer can damage the battery. Please note, that your limited warranty will void if you charge without balancer.
- Be sure, not to damage the outside of the LiPo-battery. The battery is only protected by a heatshrink. The actual Lipo-cell is directly under this heatshrink. If the outer skin of the cell gets damaged, the battery can no longer be used. Therefore take special care, that no sharp objects like knifes, tools, carbon fibre edges or similar items can damage the hardcase and/or the cells within it.
- When securing the LiPo-battery inside your model/device, you have to take care that the LiPo-battery does not get damaged or warped in case of a crash. LiPo-batteries are less mechanical resistant then NiMH-batteries in a metal can. Therfore pay special attention that the LiPo-battery does not get damaged or warped by letting it fall down, hitting it, bending it or by similar actions.
- Never charge several LiPo-battery packs at once with one charger. The different capacities and charge levels can lead to serious overcharging of the battery, even if you are using a charger with LiPo capabilities.
- Damaged packs cannot be used any longer. If the packs show signs of damage, are bent or similar, do not use the packs anymore.
- The chemical reaction during charging and discharging a LiPo-battery is not fully reversible. Due to that, LiPo-batteries loose capacity during their life-span. This is normal and neither a manufacturing nor production fault.

Disposal note: Damaged packs or packs, which can no longer be used are hazardous waste and have to be disposed of accordingly.

5. STORAGE

LRP VTEC Competition Car Line Hardcase LiPo batteries do not have a memory effect and only a very low self-discharge rate. Therefore these batteries can be stored over a longer period of time without special treatment. You only have to take care, that the batteries do not get stored completely empty.

For a storage over a longer period of time, we recommend to charge the battery up to 50% of the nominal capacity. Therefore fully discharge the battery pack and then partially charge it with a charge current of 1C for 30 minutes or charge it up to a voltage of 3.85-3.90V/cell. In this condition, the battery can be stored at least half a year at 25°C room temperature without the need of recharging it.

For a storage over a short period of time, you also have to pay attention, that the battery is partially charged. Never store the battery completely empty.

Even if you are using your battery regularly every week, always pay attention that the battery is partially charged with at least 30% of the nominal capacity during storage. A partial charge with 1C charge current for 20 minutes is sufficient in this case, if the battery was competely empty before.

If you pay attention to the above mentioned notes, you can enjoy your LRP VTEC Competition Car Line Hardcase LiPo batteries for a very long time.

6. INTERESTING FACTS ABOUT LIPO BATTERIES

- LiPo batteries shall only be charged at a temperature between 0-45°C. If this will not be observed, the cycle life of the battery will be reduced drastically.
- The single cell open circuit voltage of a fully charged LiPo battery is 4.2V. The single cell open circuit voltage of a 50% partial charged LiPo battery is approx. 3.85V. The single cell open circuit voltage of an empty LiPo battery is approx. 3.3V.
- A voltage below 3.3V per cell without load is in either case harmful for a LiPo battery. Therefore always avoid voltages below 3.3V per cell.
- It is not visible from the outside when a LiPo battery gets overcharged. The only way to find this out is to measure the voltage of the LiPo battery. The battery does not heat up nor does it swell when it gets overcharged. Therefore always check the battery voltage during charging. If it exceeds the max. charging voltage stop the charging process immediately and check all settings.
- We recommend to stop discharging a Lipo battery if the remaining capacity reaches 30% of the nominal capacity. With this, LiPo batteries will have the max. possible cycle life. Real-Life application showed, that the cycle life of LiPo batteries is reduced if the battery always gets completely discharged. This phenomenon can be seen with all types of LiPo batteries.

REPAIR PROCEDURES / LIMITED WARRANTY

All products from LRP electronic GmbH (hereinafter called "LRP") are manufactured according to the highest quality standards. LRP guarantees this product to be free from defects in materials or workmanship for 90 days (non-european countries only) from the original date of purchase verified by sales receipt. This limited warranty doesn't cover defects, which are a result of misuse, improper maintenance, outside interference or mechanical damage. This especially applies on already used batteries or batteries, which show signs of heavy usage. Damages or output losses due to improper handling and/or overload are not a product fault. Signs of wear (loss of capacity) after intensive usage are also no product fault.

To eliminate all other possibilities or improper handling, first check all other components in your model and the trouble shooting guide, if available, before you send in this product for repair. If products are sent in for repair, which do operate perfectly, we have to charge a service fee according to our pricelist.

With sending in this product, the customer has to advise LRP if the product should be repaired in either case. If there is neither a warranty nor guarantee claim, the inspection of the product and the repairs, if necessary, in either case will be charged with a fee at the customers expense according to our price list. A proof of purchase including date of purchase needs to be included. Otherwise, no warranty can be granted. For quick repair- and return service, add your address and detailed description of the malfunction.

If LRP no longer manufactures a returned defective product and we are unable to service it, we shall provide you with a product that has at least the same value from one of the successor series.

The specifications like weight, size and others should be seen as guide values. Due to ongoing technical improvements, which are done in the interest of the product, LRP does not take any responsibility for the accuracy of these specs.

LRP-Distributor-Service:

- Package your product carefully and include sales receipt and detailed description of malfunction.
- Send parcel to your national LRP distributor.
- Distributor repairs or exchanges the product.
- Shipment back to you usually by COD (cash on delivery), but this is subject to your national LRP distributor's general policy.

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The crossed-out wheeled bin means that within the European Union the product must be taken to separate collection at product end-of life. Do not dispose these products as unsorted municipal waste.